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THE MOBILITY OF INDUSTRIAL LABOR

The Problem

INDUSTRIAL labor is and should be mobile. Lack of mobility might mean the thwarting of the best hopes and prospects of the workman and his family. On the other hand, bad working conditions or petty differences with a foreman ought not to operate to make an unstable worker out of a stable one. Mobility of labor resulting from such conditions is a serious evil and should be done away with—by improvement of working conditions, by clipping the wings of the petty boss and by whatever other remedies may be called for. It is recognized, then, in dealing with this problem, that some shifting of labor from shop to shop and from city to city is normal and even desirable. It is a result partly of the normal expansion and contraction of industrial activity, partly of the voluntary shifting by the worker for the benefit of himself or of his family. In considering the question of labor mobility interest attaches, therefore, not only to its general extent but more specifically to whatever part of it may be regarded as abnormal and unnecessary. It is essential to know the nature and extent of labor instability, the various factors which are likely to increase or diminish its volume, and whether any employment methods have been or can be devised which will make it possible to reduce labor instability to such a limit that maximum production may be attained at minimum cost and to the mutual advantage of employer and employee.

A brief consideration of labor instability will show that it is generally the consequence of (1) seasonal, cyclical and other fluctuations in industrial activity, which result in varying amounts of employment available to the job seeker, (2) individual or collective dissatisfaction with the conditions of employment and (3) the dissatisfaction of employers with the services of some of their employees. In its relation to employer and employee labor instability becomes a more or less personal question and presents itself essentially in two aspects, depending upon whether it is the employee or employer who is concerned. To the individual workman, change of job may mean either gain or loss. In prosperous times, when jobs are numerous and attractive, a change may represent an actual gain to the worker. Even if there is no gain, there could scarcely be a loss, since in a rising market jobs are likely to be awaiting the employee, and even at the worst the period of unemployment between jobs is likely to be relatively short. In periods of depression the labor-mobility problem as it relates to the individual employee is a problem of unemployment and irregular employment, the employee becoming the unwilling sufferer in the matter and less commonly the willing cause of instability. The individual employer, however, is chiefly interested in the maintenance of a stable work force; he regards excessively numerous terminations of employment and, especially, voluntary and more or less avoidable separations as a serious obstacle to efficient and continuous operation. He is also very much concerned with the great expense to which he is put because of the excessive labor replacement required for the maintenance of his normal work force.

In this article the problem of labor instability is considered primarily from the standpoint of the individual establishment, not because the point of view of the individual workman is less deserving of consideration, but because the data necessary for the study of this subject were readily available only in the records of those establishments which had made serious attempts to cope with the problem of instability. Looked at from their standpoint it becomes a matter of the first importance to know where to draw the line between abnormal and avoidable labor changes and those changes which are the result of purely external causes inherent in the industrial situation,—causes over which the employer cannot exercise any effective control. Labor instability may be regarded as excessive and as pointing to maladjustment or mismanagement when its volume is in any considerable excess of its volume in the more progressive concerns which have succeeded in reducing it considerably, and more especially when its volume is in excess of that common to the particular industry in the same locality at any given time. Conversely, those firms which have a stability record considerably higher than that which commonly prevails in the industry are generally those which have successfully worked out certain definite labor and employment policies.[1]

It is the purpose of the present article to show (1) the general extent of labor mobility in industrial establishments in the United States from 1910 to 1920, (2) the relative extent of labor mobility in the various industries and localities and in different subdivisions of the work force and (3) the relative stability of the work force in those establishments which have been noticeably successful in dealing with the problem of labor instability as compared with the labor instability prevailing in the general run of industrial establishments.[2]

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[1] As already intimated, a degree of instability which is common and perhaps quite normal and necessary for one industry would be excessive for another. However, if two establishments in the same locality, of approximately equal size, employing about the same type of worker and engaged in turning out the same product, differ widely in the extent of their labor instability during identical periods of time, this difference usually indicates that the concern whose labor stability is normal, or more nearly normal, is either pursuing a more advanced labor policy, or that its labor conditions (wages, hours, living conditions *etc.*) are better, or that both of these conditions exist. In other words, excessive labor instability is likely to be the result of labor mismanagement, low wages, unsanitary working conditions, inferior or inadequate housing and transportation facilities *etc.* The frequency of the labor changes, then, is a valuable index of the extent of labor unrest in an establishment and a valuable measure of the effectiveness of the establishment's labor and employment policy.

[2] In order to give adequate consideration to the various problems involved in labor instability as it affects different industries in the United States, and more particularly to devise methods for its reduction, it will be necessary to have more detailed and extensive information than has hitherto been available. Fortunately, during the last decade a number of progressive firms have given rather close study to the whole problem of labor instability. They have made extensive experiments in labor management with a view to stabilizing the work force and have achieved a measure of success. It is especially these firms which have accumulated records sufficiently extensive to show both the magnitude and the intricacies of the problem and which will permit of a test of the effectiveness of particular labor policies and methods of employment. It is upon data from such establishments that the analytical and descriptive matter of this article is very largely based.

The figures presented in the following pages are taken from a preliminary report by the present writers on the "Mobility of Labor in American Industry", published in the June, 1920, issue of *The Monthly Labor Review* of the United States

The Measurement of Labor Mobility

Any adequate comparison of the experience of different establishments in dealing with labor instability or any clear presentation of the relative extent of that instability in different plants makes a uniform standard of measurement necessary. The complex problem of labor instability cannot be dealt with adequately or presented clearly by reference to "labor turnover", a phrase which has hitherto been used loosely in discussing labor instability generally. The use of the word "turnover" in any exact sense necessitates the assignment to it of a precise and definite meaning. This has, so far, never been done. Indeed, the different ways in which the phrase "labor turnover" is interpreted and used are distressingly numerous. To make it easier to understand the method of measuring labor mobility used in this article it may be well to clear the ground by referring briefly to three aspects of labbr mobility with which the phrase "labor turnover" has been hitherto identified. These are: (1) the number of employees hired (accessions), (2) the number leaving (separations) and (3) the number of replacements[1] required to keep up the work force.

Bureau of Labor Statistics. This report presents the outstanding results of extended field investigations made for the Bureau by the authors of this article and other members of its staff.

It is not claimed that the figures are necessarily and in all cases representative of American industry as a whole. It is realized that because of the relatively small number of establishments studied the various mobility rates shown must be regarded as merely indicative of the general mobility situation at any given time. But, whatever may be the limitations of the figures for the measurement of the amount of labor mobility at any particular time, they may be used with entire confidence in gauging the trend in mobility from season to season and from year to year. The representative character of the rates shown in these pages is further attested by the fact that these rates, as expressions of particular phases of the labor situation at stated periods, conform very closely to industrial facts generally, as those facts are reflected in other industrial phenomena, such as accidents, unemployment and so forth. The writers desire to take this opportunity to thank Mr. Royal Meeker, formerly Com. missioner of Labor Statistics, Mr. H. L. Amiss, Editor of *The Monthly Labor Review*, Mr. Lucian W. Chaney, of the staff of the Bureau of Labor Statistics, and Mr. Boris Emmet, formerly of the staff of the same Bureau, for their helpful criticism and advice.

[1] That is to say, the number of separating employees who have to be (and actually are) replaced.

The United States Bureau of Labor Statistics at first applied "turnover" to replacements.[1] Later it identified "turnover" with separations and continued to do so for a time.[2] Among private organizations the term is used in each of the three senses indicated above. It is evident that neither accessions, separations nor replacements, when used alone, adequately takes into account the constantly varying factors inherent in the industrial situation.

In regard to the base upon which the amount of labor instability is to be computed the situation also leaves much to be desired. The "number-on-pay-roll" basis, which has been most commonly used, is patently defective because of the varying number of "dead" employees included, that is, employees absent at first, who eventually separate from service but are likely to be carried on the pay-roll for varying periods of time after they have ceased to be active employees. A base subsequently recommended for use and one which more nearly approaches a true standard is the average daily work force. But it was found that even this base was hardly adequate for comparative purposes because of the widely varying length in the work day in different establishments, industries and cities.

For the purpose of measuring labor mobility the phrase "labor turnover" should obviously be given whichever one of the current interpretations appears to have the greatest practical utility. On these grounds it seems best to use the term "labor turnover" in one sense and only one, and that is as meaning the extent of shift and replacement necessary for maintenance of force. This aspect of the matter is the one with which employers of labor are most intimately concerned. However, for use in reference to the larger aspect of the flow of industrial workers into and out of industrial establishments, of which labor turnover or replacement is only one phase, a more inclusive term is necessary. It seems that the phrase "labor mobility" best serves this more general purpose, and it is accordingly so used in this paper.[1] Those hired are referred to as "accessions". Those leaving service, under whatever circumstances, are referred to as "separations". Whichever one of these two items—accessions or separations—is the smaller, may conveniently be taken as measuring the number of "replacements". The total number of labor changes—that is to say, the sum of accessions and separations—is the "labor flux". The amount by which the accessions in an expanding business are in excess of the separations is the amount of "labor increase". The amount by which the separations in a plant which is curtailing operations exceed the accessions is the amount of "labor decrease".[2]

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[1] "Street Railway Employment in the United States", Bureau of Labor Statistics, *Bulletin* 204, pp. 193–203.

[2] See articles on labor turnover in the *Monthly Labor Review* for October, 1918, and January, February and March, 1919. It is in the sense of separations that "turnover" has been used most commonly. This interpretation has been authoritatively expressed in the formula adopted by the National Association of Employment Managers, now the Industrial Relations Association of America. See "Standard Definition of Labor Turnover and Method of Computing Percentage of Labor Turnover", formulated by a special committee at the Rochester Conference of Employment Managers, Rochester, N. Y., May, 1918. This "standard definition" is given in full in the *Monthly Review* of the Bureau of Labor Statistics for June, 1918, pp. 172–173.

As the base or standard work force to which the number of labor changes (the number of replacements, accessions *etc.*) must be compared in order to show the frequency or rate of change, use is made in this article of the aggregate number of hours actually worked by all employees. This is a genuine standard base, inasmuch as it accurately represents the volume of employment or the amount of industrial exposure. This base at once eliminates all inflation due to "dead" and "broken-time" names on the pay-roll, putting establishments with varying amounts of employment on a par and thus making possible the strictest comparability.[3]

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[1] The expression "labor mobility" connotes movement. From the employers' standpoint it will sometimes be convenient to refer to this condition as "instability" or even to use the word "stability"—where that word seems to be appropriate.

[2] The relations between accessions, separations, replacements and flux may be seen from the tabular presentation in Table I.

[3] In the earlier studies of labor turnover made by the Bureau of Labor Statistics the average daily work force was first used as a base but was later changed to the full-year, or 3000-hour, worker. Finally, it was decided to use the unit labor hour or some decimal multiple thereof.

The exact method of measuring labor mobility used in this article may be briefly outlined as follows: The general extent of labor mobility is determined statistically by comparing the total movement of labor in and out (accessions and separations) during any given period with the number of labor hours put in by the work force during that period. This flux or total labor-change rate is believed to be the best single index figure to use in showing the general situation with respect to stability in any plant or group of plants and in subdivisions within individual establishments. The flux rate is made up of the accession rate and the separation rate. The two latter rates should be shown separately in order to reveal the whole stability situation. The rate of replacement or "turnover", which means the rate at which separating employees whose places must be filled are replaced by others, may be, for all practical purposes, defined as the rate of separation when that rate is lower than the accession rate and as the rate of accession when that rate is lower than the separation rate. Furthermore, the separation rate should be subdivided so as to show the relative responsibility of "discharges", "lay-offs" and "quits" for the total labor out-flow. The more important mobility rates may be classified as follows:

$$\text{Labor mobility rates}\left\{\begin{array}{l}\left.\begin{array}{l}\text{accession (hiring) rate}\\ \left.\begin{array}{l}\text{quitting rate}\\ \text{discharge rate}\\ \text{lay-off rate}\end{array}\right\}\text{separation rate}\end{array}\right\}\text{flux rate}\\ \text{replacement (or ``turnover'') rate}\end{array}\right.$$

In the present article these different mobility rates are shown, with one or two exceptions, as rates per 10,000 labor hours.[1] For illustration: The figures in Table I show that during the year ending May 31, 1918, the sum total of accessions and separations for the 176 establishments reported was 1,244,640, of which number 631,173 were accessions and 613,467 were separations. The number of labor hours worked in these plants during this period was 917,703,000. Consequently, the FLUX rate (per 10,000 labor hours) is . . . . $\frac{1,244,640}{917,703,000} \times 10,000 = 13.6$

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[1] So far as the 10,000 labor hours base is concerned, this is essentially the method which has recently been adopted by the Bureau of Labor Statistics for the computation of industrial accident frequency and severity rates. (For details see *Monthly Labor Review*, January, 1920, pp. 218–19.)

the ACCESSION rate is . . . . $\frac{631,173}{917,703,000} \times 10,000 = 6.9$

and the SEPARATION[1] rate . . . . $\frac{613,467}{917,703,000} \times 10,000 = 6.7$

The rates for any departmental, occupational or other subdivision of the work force should be computed in a similar way. Thus, for example, to get the accession rate for a particular department or occupation, divide the number hired during the period covered by the number of labor hours worked in the same group. The relation between the three principal methods which have been used hitherto in labor-turnover computation is shown in the following tabulation:

Comparison of Three Methods of Measuring Labor Mobility

	Accession	Separation	Labor flux
	(1) Rate per 10,000 labor hours		
1913–14	3.1	3.3	6.4
1917–18	6.9	6.7	13.6
	(2) Rate per full-year (3000-hour) worker		
1913–14	0.9	1.0	1.9
1917–18	2.1	2.0	4.1
	(3) "Percentage of turnover" (Rochester method)		
1913–14	. . .	100	. . .
1917–18	. . .	200	. . .

A separation rate of 1.0 per full-year (3000-hour) worker, as the Bureau of Labor Statistics has lately computed mobility rates, or a separation rate (called, in the Rochester method, "percentage of turnover") of 100 per hundred on the work force, as the Bureau formerly computed "turnover", are both equivalent to a separation rate of 3.3 per unit of 10,000 labor hours as used in this article. Similarly, an accession rate of

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[1] It is evident, in this particular example, that the separation rate, being lower than the accession rate, must also be the replacement rate.

3.3 (per 10,000 labor hours) is the same as an accession rate per full-year worker of 1.0. Assuming that the accession and separation rates are both 3.3, the flux rate on the new basis explained above would be 6.6, which is the same as a flux rate of 2.0 per full-year worker. Such a rate indicates that during the period under observation as many persons left and as many were hired as there were full-year workers employed. When the accession and separation rates in any establishment both stand at or close to 3.3, thus giving a flux rate of 6.6, the situation in that plant is one equivalent to a complete over-turn of the work force. But this flux rate of 6.6, which indicates the turnover of the entire work force, may actually represent three distinctly different industrial situations, the revelation of which is one of the useful functions of accession and separation rates: (1) accessions 3.3, separations 3.3: a going concern, which is neither expanding nor curtailing its operations; (2) accessions 4.4, separations 2.2: a concern which is undergoing more or less rapid extension of plant; (3) accessions 2.2, separations 4.4: a concern which is curtailing activities. One or another of these three different situations is involved in every rate of total labor change, whether it be in a very stable plant with a flux rate of 3.0 or a very unstable one with a flux rate of 12.0.[1]

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[1] The fact should be emphasized that the primary object in gauging the extent of labor mobility is to ascertain the number of labor changes involved in the maintenance (and the necessary expansion or reduction) of the labor force. The number of different individuals involved in these changes is of less importance here than the number of repeated transactions. The computation method here used indicates the number of changes which take place, but it obviously involves double counting and does not, therefore, furnish a true report of the number of different persons involved in the labor shiftings. The accession rate reported for a single concern is sure to include some employees who have been hired more than once during the period covered by the figures. The same is true of the separation rate and the flux rate. The figures for a group of establishments may also contain the accessions of certain employees whose separations are included, as they should be, in the separation figures for the same group. It is important to observe that this double counting does not affect the accuracy of figures designed to show merely repeated transactions. Moreover, since the concerns here reporting are widely scattered geographically and well distributed as to industry, there would not be likely to be many employees shifting from job to job within the group of firms reported. That is to say, when a worker left one of these plants the chances would be heavily against his being taken on by one of the other firms in this small group. But if he is so taken on, he is rightly to

Extent of Labor Mobility

The enormous proportions that labor mobility may assume will be appreciated from an examination of Table I, where the combined figures for the years 1910 to 1919 show that the accomplishment in the establishments reporting of 6,353,046,000 hours of work, which is labor time equivalent to that of 2,117,682 full-year (3000-hour) workers, entailed 2,564,037 accessions and 2,481,280 separations, or a total of 5,045,317 labor changes. In other words, on the average, for each year of the decade, 256,404 accessions, 248,128 separations, or a total of 504,532 labor changes, were involved in the maintenance and the necessary enlargement or curtailment of a labor force of 211,768 workers. This means that the maintenance and the necessary expansion or curtailment of the requisite work force involved labor changes considerably more than equivalent to a complete annual overturn of the work force. This is as if during one year all the employees had left their jobs, and a new set of work people had taken their places. It appears, then, that for each year, on the average, the number of persons leaving, whether they quit, were laid off or were discharged, as well as the number who had to be hired, was much larger than the total number of workers on the force at any one time.

Bearing in mind the fact that a flux rate of 6.6 represents a complete overturn of force, we see from an examination of the rate figures of Table I that in six of the ten calendar years represented the number of labor changes in the plants report-

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be counted twice, since he has made two labor changes. For more detailed treatment of this widely discussed problem of the measurement of labor turnover see: "Computing Labor Turnover: a Questionnaire", *Industrial Management*, vol. 56, pp. 239–246 (September, 1918); Doten, Carroll W., "Computing Labor Turnover", *Industrial Management*, vol. 56, p. 339 (October, 1918); Emmet, Boris, "The Nature and Computation of Labor Turnover", *Journal of Political Economy*, vol. 27, pp. 105–116 (February, 1919); Crum, F. S., "How to Figure Labor Turnover", *Quarterly Publications of the American Statistical Association*, vol. 16, pp. 361–373 (June, 1919); Douglas, Paul H., "Note on Methods of Computing Labor Turnover", *American Economic Review*, vol. 9, pp. 402–405 (June, 1919); Slichter, S. H., "The Scope and Nature of the Labor Turnover Problem", *Quarterly Journal of Economics*, vol. 34, pp. 329–345 (February, 1920); and Brissenden, P. F., "The Measurement of Labor Mobility", *Journal of Political Economy*, vol. 28, pp. 441–476 (June, 1920).

TABLE I

LABOR MOBILITY, BY YEARS, 1910–1919

[Replacement (or "turnover") numbers and rates are marked by asterisks (*)]

Year	Number of establishments	Number of workers[1]	Total labor hours (thousands)	Labor changes		
				Accessions	Separations	Total (Flux)
	Number					
1910	16	85,263	255,789	90,408	86,179*	176,587
1911	24	109,653	328,959	94,029*	96,915*	190,944
1912	54	188,363	565,089	210,085	182,287*	392,372
1913	113	399,449	1,198,347	541,746	535,118*	1,076,864
1913–14[2]	84	244,814	734,442	227,008*	243,707	470,715
1914	162	373,287	1,119,861	300,121*	326,755	626,876
1915	51	159,054	477,162	122,211	99,734*	221,945
1916	20	94,803	284,409	131,300	101,102*	232,402
1917	27	58,052	174,156	79,287	74,917*	154,204
1917–18[2]	176	305,901	917,703	631,173	613,467*	1,244,640
1918	29	56,411	169,233	97,918	84,999*	182,917
1919	19	42,632	127,896	38,751	36,100*	74,851
Total		2,117,682	6,353,046	2,564,037	2,481,280*	5,045,317
	Rate per 10,000 labor hours[3]					
1910				3.5	3.4*	6.9
1911				2.9*	2.9*	5.8
1912				3.7	3.2*	6.9
1913				4.5*	4.5*	9.0
1913–14[2]				3.1*	3.3	6.4
1914				2.7*	2.9	5.6
1915				2.6	2.1*	4.7
1916				4.6	3.6*	8.2
1917				4.6	4.3*	8.9
1917–18[2]				6.9	6.7*	13.6
1918				5.8	5.0*	10.8
1919				3.0	2.8*	5.8
Total				4.0	3.9*	7.9

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[1] The figures in column headed "Number of workers" in this and following Tables in this article are obtained by dividing the total labor hours by 3000. These figures are given simply to indicate the approximate size of the work force to make it possible directly to compare the absolute number of labor changes with the number of employees in the work force.

[2] The figures given for 1913–14 and 1917–18 are from establishments reporting in great detail during the two field investigations of this subject made by the Bureau of Labor Statistics in 1914 and 1918. The time covered by the statistical data from these establishments is a 12-month period ending usually, about the middle of 1914 and 1918, respectively. This applies to the material shown for these dates throughout this article.

[3] Computed, as already explained, by dividing number of labor changes by the total number of labor hours and multiplying by 10,000.

ing has been more than equivalent to a complete overturn of the work force; that is, there were at least as many accessions and at least as many separations as there were workers on the force.[1] Even in 1915, the most stable year of the decade, there were 122,211 accessions and 99,734 separations entailed in the maintenance and enlargement of a work force of 159,054 employees. This is equivalent to a complete overturn of nearly 75 per cent of the work force during the year. In 1917–18, the most unstable of the periods shown, 631,173 accessions and 613,467 separations, or a total of 1,244,640 labor changes, were involved in the maintenance and enlargement of a work force of 305,901 workers. This is equivalent to more than two complete overturns of the work force during the year.

On the basis of the unit full-year (3000-hour) worker the situation in the decade reported may be described as follows: Throughout the ten-year period, for every equivalent 3000-hour worker in the aggregate work force, there were on the average more than two labor changes per year. In 1915, the period of least instability, there were about one and a half labor changes for each full-year worker. In the war period, 1917–18, there were more than four labor changes for each full-year worker in the aggregate work force. This is as if during these 12 months all the employees had left their jobs, an entirely new set had come in to fill their places, and afterward all the employees in this second set had left their jobs and had in turn been fully replaced by a third set of workers.

There is also to be observed a very definite tendency of the mobility rates to vary with the prevailing industrial situation. This is indicated by relatively high mobility rates for the years 1913 and 1917–18, years of great industrial activity, and by a recession in the rates in years in which the industrial situation has been less favorable. The peak in the rates, indeed, occurs in the period 1917–18, when war-time necessities forced far-reaching changes in the character of the products manufactured as well as in manufacturing processes. This gave rise to an unusual industrial situation marked by a peculiar war psychology, causing general restlessness and unusually extensive labor shifting.[1]

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[1] Assuming, of course, a rough equality between the accessions and separations. Actually there is only a tendency to such equality.

Enormous as is the extent of labor instability indicated by the figures presented in Table I, it is fair to assume (and this assumption is supported by a good deal of fragmentary evidence) that the actual situation is even worse. The (nearly) 500 establishments from which the labor-mobility figures have been secured are necessarily the concerns which had the figures to give, that is to say, concerns which had given rather more attention than most firms to their force-maintenance problems. The firms reporting are chiefly concerns which had more or less centralized employment systems and were relatively more successful in the maintenance of a stable work force. In such establishments the instability situation is not likely to be as serious as in the general run of American industrial concerns, which as a rule pay little or no attention to the flow of labor in and out and give little if any thought to its control.

The replacement or "turnover" numbers and rates in Table I are indicated by asterisks. Thus in 1910 persons were being hired at a rate of 3.5, and employees were leaving at a rate of 3.4 per 10,000 labor hours. The aggregate standard work force was obviously undergoing expansion, and all separating employees were (more or less promptly) replaced. The separation rate, therefore, is to be taken as the replacement (or "turnover") rate. In 1914 the situation was very different. Most industrial plants were curtailing operations. The result was an accession rate of 2.7 and a separation rate of 2.9. In these circumstances it is obvious that not all the separating employees were replaced—even tardily—and that consequently the accession rate is to be taken as the replacement rate. In 1914, obviously, not all of the 326,755 separating employees contributed to the turnover, as that word is here defined. There were only 300,121 persons hired during that year. This number therefore measures the turnover, because this is the number of abandoned jobs which were replaced. The turnover (or replacement) rate, then, is the ratio between 300,121 and the 1,119,861,000 labor hours which were put in during the time within which those replacements were made. The excess of separations, amounting in 1914 to 26,634, involves a phase of labor mobility not included in turnover. This excess shows the extent to which the standard work force was diminished during 1914 and in relation to the labor hours is, as already explained, the labor-decrease rate; and the corresponding excess of accessions in such a year as 1918 is the labor-increase rate. In years like 1911 and 1913 the rates of accession and separation are equal, and it would make little difference which figure was taken to measure replacements. Reference to the actual numbers in the upper part of the Table, however, shows that in 1911 the accessions were somewhat less numerous and therefore most nearly measured replacements, whereas in 1913 the separations were fewer and that in that year, therefore, they should be identified with replacements. In general, throughout the ten-year period the accessions and separations have naturally tended to balance each other pretty closely, although they show slight variations reflecting the changing industrial conditions from year to year. Over the whole decade it is to be noted that the accessions appreciably exceed the separations, indicating a net increase in the gainfully employed population and just about such a normal industrial expansion as would naturally be expected.[1]

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[1] It is probable that the labor mobility for the year 1919 is actually higher than is indicated by the figures shown here, since the number of establishments upon which the rates are based is rather small and includes a number with unusually low labor mobility records.

[1] During the last few years speculation has been rife as to the probable aggregate number of labor changes over a given period in all the industrial establishments of the country. Interesting though the knowledge of these facts would be, the task of gathering such figures, even if all establishments kept labor-mobility records, would be so stupendous that it could scarcely be seriously considered. It is necessary, therefore, to resort to estimates based on a careful analysis of the available labor-mobility figures. Thus, applying the 1914 mobility rates here reported to the industrial population of the United States of that year as shown by the United States Census of Manufactures of 1914, the latest figures available, it would appear that the more than 5,000,000 workers fully employed that year must have involved about 4,000,000 accessions and nearly 4,500,000 separations, or a total of more than 8,000,000 workers changing jobs that year.

TABLE II

MOBILITY RATES IN SPECIFIED INDUSTRY GROUPS

Number of establishments, 1913–14, 84; 1917–18, 176

[Replacement (or "turnover") rates are indicated by asterisks (*)]

Industry group	Rate, per 10,000 labor hours, of:—					
	Accession	Separation	Flux	Accession	Separation	Flux
	1913–14			1917–18		
Automobiles and parts	5.2*	5.4	10.6	7.7	7.6*	15.3
Chemical industries and refineries	4.0	3.5*	7.5	9.9	8.4*	18.3
Clothing and textile manufacturing	2.1*	2.2	4.3	4.2*	4.7	8.9
Furniture and millwork	. .	. .	. .	8.3*	10.2	18.5
Leather and rubber goods	5.3	4.5*	9.8	8.0*	8.2	16.2
Machinery manufacturing	2.7*	3.6	6.3	5.5	5.3*	10.8
Mercantile establishments (wholesale and retail)	2.4	2.2*	4.6	4.6*	4.8	9.4
Miscellaneous metal products manufacturing	2.7*	3.1	5.8	10.6	10.1*	20.7
Printing and publishing	2.3	2.2*	4.5	5.9*	6.3	12.2
Public utilities: gas and electricity	0.5*	1.0	1.5	4.6*	4.7	9.3
street railway	0.9*	0.9	1.8	2.7*	3.2	5.9
telephone service	1.3*	1.6	2.9	3.1*	3.4	6.5
Slaughtering and meat packing	8.5	8.0*	16.5	8.5	7.3*	15.8
Total	3.1*	3.3	6.4	6.9	6.7*	13.6

A separate tabulation of mobility rates for the period 1913–14 and 1917–18 was made for the following localities: Boston, Chicago, Cincinnati, Cleveland, Detroit, Milwaukee, New York and San Francisco. In the period 1913–14 the higher mobility rates are centered in Chicago, with a flux rate of 8.4, Cincinnati, with a rate of 7.9 and Detroit, with a rate of 9.9. A noticeable change is evident in the period 1917–18, the cities of Cleveland, Detroit and San Francisco showing flux rates of 16.8, 15.1 and 17.0 respectively, indicating the effect of the unusual industrial activity caused by the war.[1]

In Table II the mobility-rate figures for the two periods, 1913–14 and 1917–18, are classified by industry groups.

The tabular array shows the general increase of mobility rates over the pre-war period and throws interesting side-lights upon the influence of the war upon certain of the industry groups represented. Those which were most immediately affected by the necessity for articles of war are: automobiles and parts, chemical industries, leather and rubber goods, machinery manufacturing, miscellaneous metal products, and slaughtering and meat packing. All of these groups, with one exception, show a decided increase in mobility rates over those of the pre-war period. The rates of the slaughtering and meat-packing group show only a slight decrease. This is not surprising in view of the fact that the mobility rate for this group in 1913–14 was already more than twice as great as the rate for all groups combined.[2]

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[1] For more detailed figures on labor mobility in different localities see the following articles, published in the *Monthly Labor Review* during the year 1919: "Labor Turnover in Cleveland and Detroit", by Boris Emmet, January, pp. 11–30; "Labor Turnover in the San Francisco Bay Region", by P. F. Brissenden, February, pp. 45–62; "Labor Turnover in Cincinnati", by Emil Frankel, March, pp. 35–52; "Labor Turnover in Milwaukee", by W. F. Kirk, April, pp. 53–70; "Labor Turnover in Chicago", by Emil Frankel, September, pp. 44–59.

[2] To undertake to show some definite relationship between the size of the establishment and labor mobility, detailed figures regarding the labor changes were so arranged as to show the mobility rates of establishments with less than a thousand employees, of those having one thousand and under five thousand and of those with over five thousand employees. In 1913–14 the flux rates for the different sizes of establishment in the order given above were: 9.7, 5.9, and 6.2 respectively. The 1917–18 figures show flux rates of 17.3, 14.3 and 11.5 respectively. These figures, in the main,

Necessary and Unnecessary Labor Changes

Repeated attempts have been made in the last few years to ascertain the proportion of the labor replacement which may be regarded as avoidable. Such a separation of the necessary from the unnecessary replacement has been undertaken on the natural assumption that the maintenance of the working force requires the hiring of only a certain number of workmen to replace those who have left for unavoidable reasons (death, sickness, discharges for manifest unfitness *etc.*), and that whatever number of persons is found to be required over and above this so-called irreducible minimum—which has been estimated by a number of students at about 25 per cent of the work force—must be the measure of unnecessary replacement. The limits of this article do not permit a full discussion of the question as to whether or not labor-mobility data (referring as they do to a phenomenon which is subject to constant and sometimes extreme industrial fluctuations) can be so simplified as to express in exact figures the proportion of necessary and unnecessary labor replacement. Actually to apply to industrial establishments as they are this method of appraising the responsibility in labor replacement presupposes wholly static industrial concerns with unvarying amounts of employment and with work forces composed of persons who are very slightly, if at all, influenced by outside industrial forces. To be sure there will be found industrial concerns which can offer steady em-

indicate a downward trend in mobility rates as the size of the establishment increases. It has not been possible to ascertain the exact reason for the relatively lower rates in the larger establishments, though it is conceivable that among the factors influencing the stability was the possibility of the larger establishments offering steadier work, relatively higher earnings and better employment conditions generally. Lower rates might also indicate the efficiency of employment departments and the influence of service and welfare activities, which are generally carried on more extensively by the larger establishments. It should be noted that in the larger establishments there must be many inter-departmental changes which are not included in the figures presented here. This is one reason why the flux rate is lower in the large concerns. Obviously the number of such interior labor changes is smaller, both absolutely and relatively, in the small than in the large establishments. The small single-department concern must recruit virtually all its new labor from outside accessions. The inter-departmental labor shift is in some cases quite as much a sign of labor instability as if the shift were from one employing firm to another employing firm.

ployment to a certain small number of persons. In such establishments any of these employees leaving voluntarily and for no valid reason may be definitely considered as factors in the unnecessary labor replacement. But it would be extremely difficult to say when and to what extent the great mass of employees (who are at the mercy of labor-market fluctuations) may be regarded as contributing to the necessary or unnecessary labor replacement.

Bearing these limitations in mind and assuming that the strictly necessary part of the replacement amounts to 25 per cent of the work force (an assumption whose confirmation requires much further investigation), the mobility figures of any firm or group of firms might be presented in such a way as to show, separately, the necessary and unnecessary labor replacement. The figures are given in Table III.

Taking for illustration the figures for the period 1917–18 and assuming as necessary for force maintenance the replacement of 25 per cent of the work force,[1] it would appear that the maintenance of the aggregate work force of 305,901 employees in the 176 establishments reporting in 1917–18 should have required only 76,475 replacements. In addition to these replacements there need to be taken into account the persons required to take care of the expansion which the aggregate work force underwent during the period under consideration. The amount of this expansion is measured by the excess of accessions over separations, which is in this case 17,706. The total necessary changes were, therefore, 76,475 separations requiring replacement, 76,475 accessions for this replacement and 17,706 labor-increase accessions, or a total of 170,656 necessary labor changes. Actually, there were 1,244,640 labor changes. The difference is 1,073,984, which is the number of "unnecessary" labor changes. This amounts to 86 per cent of all labor changes. The year 1915 appears to have been least burdened with these unnecessary labor shiftings. In that

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[1] And taking for granted, of course, the necessity for whatever increase or decrease changes (accessions or separations, as the case may be) naturally result from the (more or less) permanent extension or curtailment of industrial operations.

TABLE III

NECESSARY AND UNNECESSARY LABOR CHANGES

By years, from 1910 to 1919, inclusive

Year	Number of workers[1]	Labor changes necessary to replace 25 % of force and to take care of work-force expansion or contraction				Total actual labor changes[1]	"Unnecessary" labor changes	
		Separating employees who must be replaced	Persons taken on to fill their places	Additional persons taken on for expanding work-force (E) or additional persons separating on account of curtailing work force (C)	Total necessary labor changes		Number	Per cent of total actual changes
1910	85,263	21,316	21,316	4,229 (E)	46,861	176,587	129,726	73
1911	109,653	27,413	27,413	2,886 (C)	57,712	190,944	133,232	70
1912	188,363	47,091	47,091	27,798 (E)	121,980	392,372	270,392	69
1913	399,449	99,862	99,862	6,628 (E)	206,352	1,076,864	870,512	81
1913–14	244,814	61,204	61,204	16,699 (C)	139,107	470,715	331,608	70
1914	373,287	93,322	93,322	26,634 (C)	213,278	626,876	413,598	66
1915	159,054	39,764	39,764	22,477 (E)	102,005	221,945	119,940	54
1916	94,803	23,701	23,701	30,198 (E)	77,600	232,402	154,802	67
1917	58,052	14,513	14,513	4,370 (E)	33,396	154,204	120,808	78
1917–18	305,901	76,475	76,475	17,706 (E)	170,656	1,244,640	1,073,984	86
1918	56,411	14,103	14,103	12,919 (E)	41,125	182,917	141,792	78
1919	42,632	10,658	10,658	2,651 (E)	23,967	74,851	50,884	68

year in the firms studied only 54 per cent of the labor changes were unnecessary changes. Computing the rates corresponding to the figures just given for 1917–18, it appears that the accession rate of 6.9 would be reduced to 1.0, the separation (here the replacement) rate of 6.7 to 0.8, and the flux rate of 13.6 to 1.8, if only the strictly necessary labor changes were made.

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[1] Figures taken from Table I.

Labor Mobility in Different Groups Within the Work Force

Although general business and industrial conditions are responsible to a very large extent for the varying degree of the mobility of labor, many other factors influence labor stability in one way or another. A few of the more important ones, the influence of which is brought out in the following pages, are briefly enumerated here: the nature of the labor force, that is to say the extent to which an establishment employs males and females, unskilled, semi-skilled or skilled workers, or whether the work force consists largely of clerical employees or of persons engaged in non-mechanical occupations; the nature of the work, that is, whether or not it is generally disagreeable—involving exposure to dampness, noxious odors, great heat, dust *etc.;* the proportion of long-service employees in an establishment, such employees generally changing jobs less frequently in times of great industrial activity when the tendency to instability is greatest; the seasonal nature of the industry, necessitating frequent lay-offs of portions of the work force, thus increasing the proportion of separations and necessitating a correspondingly greater number of rehirings when the work force is again enlarged. Figures showing, on the basis of some of these intra-plant factors, the distribution of labor mobility within the establishment work force are presented in the following paragraphs.[1]

A special study of the relative labor mobility among males and females in the labor forces of 45 establishments for the period of 1917–18 showed the following mobility rates: males —accession rate 5.6, separation rate 6.0, flux rate 11.6; females—accession rate 4.1, separation rate 3.7, flux rate 7.8. Although the rates for females are actually lower, this cannot be said to offer conclusive evidence that the shifting is generally less extensive among women since the comparison of the mobility between males and females is not invariably made between employees in the same occupation and doing similar work. This is especially noticeable in industry groups in which the female labor force constitutes only a small fraction of the total work force and is composed almost entirely of clerical employees.

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[1] See in this connection the following studies of labor mobility in special industry groups: "Freight Handlers on Passenger-Freight Steamers on the Great Lakes", and "Labor Turnover of Seamen on the Great Lakes", by Emil Frankel, *Monthly Labor Review*, April and June, 1918, "Labor Policies and Labor Turnover in the California Oil Refining Industry" and "Labor Turnover among Employees of a California Copper Mining and Smelting Company", by P. F. Brissenden, *Monthly Labor Review*, April and May, 1919.

The records of 32 of the establishments studied were in such shape that it was possible to compare the stability records of skilled and unskilled workers. The figures are shown in Table IV.

TABLE IV

LABOR MOBILITY OF SKILLED AND UNSKILLED WORKERS, 1913-1915 AND 1917-18

[10 establishments reporting for 1913, 5 for 1914 and 7 for 1915; 10 establishments reporting for year ending May 31, 1918]

Class of workers	Number of workers	Total labor hours	Labor changes		
			Accessions	Separations	Total (flux)
			Number		
1913-1915					
Skilled.	24,733	74,199,000	14,848	16,484	31,332
Unskilled	15,660	46,980,000	20,042	22,251	42,293
Total.	40,393	121,179,000	34,890	38,735	73,625
1917-18					
Skilled.	16,169	48,507,000	21,919	24,830	46,749
Unskilled.	4,408	13,224,000	19,661	19,203	38,864
Total	20,577	61,731,000	41,580	44,033	85,613
			Rate per 10,000 labor hours		
1913-1915					
Skilled.	. . . . . .	. . . . .	2.0	2.2	4.2
Unskilled.	. . . . . .	. . .	4.3	4.7	9.0
Total	. . . . . .	. . . .	2.9	3.2	6.1
1917-18					
Skilled.	. . . . . .	. . . . .	4.5	5.1	9.6
Unskilled.	. . . . . .	. . . . .	14.9	14.5	29.4
Total	. . . . . .	. . . . .	6.7	7.1	13.8

The labor-mobility rates for the two classes of labor show that in both periods unskilled labor was much more unstable than skilled labor. Moreover, this excess of instability on the part of the unskilled was much greater in the war period than in the pre-war period. In the earlier period the mobility rates of the unskilled were more than double the rates for the skilled. In 1917 the mobility rates of the unskilled were three times as great as those of the skilled. In the earlier period there was, among the skilled, slightly more than one labor change for each skilled member of the working forces of the 22 plants and nearly 3 changes in jobs for each unskilled worker. In 1917–18 there were nearly three skilled-labor changes for each skilled worker and about 9 unskilled-labor changes for each unskilled worker.

Character of Separations

In attempting to form some idea of the relative responsibility of the various influences bearing upon the mobility of labor it is highly important to give some special consideration to the three types of separations, namely, voluntary separations or quits, discharges and lay-offs. In Table V are given the number, rate per 10,000 labor hours, and the percentage distribution of all separations of employees discharged, laid off and leaving voluntarily. Figures are shown for each year from 1910 to 1915, inclusive, and for the 12-month period ending May 31, 1918.

The arresting fact shown in the above rate and percentage distribution figures is that the great bulk of all separations today, as in 1910, is due to voluntary leaving. It also appears from these figures that periods of industrial prosperity are reflected in relatively low, and periods of depression in relatively high, proportions of lay-offs to total separations, and that the lay-off rate is the most sensitive of the three separation rates to changing industrial conditions. Thus, in 1914, when the ratio of quits to total separations was lower than at any other time during the period covered by the figures, the proportion of lay-offs was higher than at any other time, constituting nearly one-third (31 per cent) of all separations, while in the imme-

TABLE V

TYPE OF SEPARATION (DISCHARGE, LAY-OFF OR VOLUNTARY QUITTING) OF EMPLOYEES LEAVING, BY YEARS FROM 1910 TO 1915, INCLUSIVE, AND FOR THE 12-MONTH PERIOD ENDING MAY 31, 1918

Year	Number of establishments	Number of workers	Total labor hours	Accessions	Separations			
					Discharges	Lay-offs	Voluntary separations	Total
1910...	7	23,273	69,819,000	15,936	2,608	514	14,230	17,352
1911...	13	56,577	169,731,000	53,506	9,837	5,082	35,716	50,635
1912...	20	72,526	217,578,000	78,843	13,628	4,057	49,806	67,491
1913...	35	134,823	404,469,000	182,276	32,094	13,334	141,035	186,463
1914...	50	118,195	354,585,000	82,585	19,565	29,737	46,660	95,962
1915...	28	78,984	236,952,000	50,421	6,946	8,536	26,862	42,344
1917–18	108	207,303	621,909,000	393,164	51,400	29,833	299,157	380,390
Total.	261	691,681	2,075,043,000	856,731	136,078	91,093	613,466	840,637

Year	Rate per 10,000 labor-hours					Percentage of total separations due to—		
	Accessions	Separations						
		Discharges	Lay-offs	Voluntary separations	Total	Discharges	Lay-offs	Voluntary separations
1910...	2.28	0.37	0.07	2.04	2.48	15	3	82
1911...	3.15	.58	.30	2.10	2.98	19	10	71
1912...	3.62	.63	.19	2.29	3.11	20	6	74
1913...	4.51	.79	.33	3.49	4.61	17	7	76
1914...	2.33	.55	.84	1.32	2.71	20	31	49
1915...	2.13	.29	.36	1.13	1.78	16	20	63
1917–18	6.32	.83	.48	4.81	6.12	14	8	79
Total.	4.13	.66	.44	2.96	4.06	16	11	73

diately preceding year, 1913, lay-offs made up only 7 per cent of all separations. The rate figures indicate that it is not alone the proportion but also the actual rate of lay-off which is thus affected by business activity and depression, the lay-off rate for

1913 being .33, a relatively low figure, and for 1914, .84, an exceedingly high rate for lay-offs. The discharge rate is evidently subject to less extreme fluctuations than the lay-off rate and it makes up from year to year a more constant proportion of the total separations. There appears, moreover, to be a rather definite relation between the accession and discharge rates, due, possibly, to the process of selection which goes on when new workers are taken on in large numbers. The consequence of the stimulating effect of business prosperity in boosting the voluntary leaving rates may be seen in the high rates of total separation—rates which are high in spite of the fact that the corresponding lay-off rates are usually relatively low. In periods of depression both the rates and the proportions of lay-off and discharges are larger than in periods of prosperity. This is due to the fact that when depression sets in there are unusually large numbers laid off, and employees are discharged more freely than would be the case when labor is urgently needed.

Seasonal Influences on Labor Mobility

Reference has already been made to the marked fluctuations in mobility rates from year to year with changing industrial conditions. The figures of Table VI showing the monthly trend in flux rates from January, 1910, to December, 1919, inclusive, bring out in greater detail the extent to which mobility figures immediately reflect the industrial conditions prevailing at the time.[1]

The monthly flux-rate figures in the Table show how wide a seasonal range of mobility is represented by each yearly rate. The flux rate was relatively high in 1910, a year of business expansion, but dropped during the reaction period of 1911, falling in December to the low flux (*i. e.*, high stability) rate

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[1] Based upon following numbers of establishments, reporting monthly figures:

1910 . .	3	establishments	1915 . .	30	establishments
1911 . .	6	"	1916 . .	10	"
1912	8	"	1917 . .	20	"
1913	· 39	"	1918 . .	19	"
1914 . .	26	"	1919 . .	9	"

TABLE VI

LABOR FLUX RATES, BY MONTHS, FROM JANUARY, 1910, TO DECEMBER, 1919, INCLUSIVE

Month	Total labor change (flux) rate per 10,000 labor hours in—										
	1910	1911	1912	1913	1914	1915	1916	1917	1918	1919	Whole period 1910-1919
January	8.3	4.4	4.4	10.8	4.3	3.8	11.7	9.5	11.7	9.4	8.5
February	8.5	4.9	4.8	9.6	4.2	4.5	11.9	7.9	11.4	6.4	8.0
March	12.5	5.6	5.7	11.3	5.1	5.5	10.0	7.9	14.0	6.3	9.0
April	14.0	6.1	7.0	13.1	4.8	6.1	10.9	9.4	16.4	6.1	10.1
May	13.5	7.1	7.5	12.5	6.5	5.3	10.8	13.4	15.7	6.1	10.2
June	12.9	7.5	7.7	10.4	7.3	4.9	11.0	12.7	13.6	6.0	9.2
July	11.9	6.6	8.3	9.8	5.0	5.1	7.0	11.6	14.2	5.9	8.3
August	13.6	7.1	9.0	7.7	6.1	5.1	9.3	13.7	13.8	8.0	8.1
September	9.3	4.7	8.2	7.9	6.1	7.9	7.7	13.1	10.5	8.2	8.2
October	7.4	4.6	8.5	6.3	4.8	7.3	6.8	12.3	10.2	8.7	7.2
November	6.4	4.3	6.9	5.1	3.7	10.5	4.9	11.2	8.8	6.1	6.6
December	3.7	3.8	6.3	4.2	4.1	7.7	5.8	11.8	8.0	4.0	6.0
Year	10.1	5.6	7.0	9.1	5.1	6.1	8.8	11.4	12.7	6.7	8.3

of 3.8, a degree of stability not again reached until the autumn of 1914, in November of which year of business depression it fell to 3.7. The flux rate rose generally in 1912 and 1913 but dropped toward the end of 1913 and remained low during 1914 and until the autumn of 1915, when it rose slightly, followed by a further rise and continued high mobility levels during the winter and spring of 1916. The summer and autumn of 1916 and the winter of 1917 were periods of greater stability. In the late spring of 1917, after our entry into the war, the labor-flux rate jumped to higher points than it had touched since the spring of 1913. There was—and this is an unusual circumstance—only a very slight increase in mobility during the following summer, autumn and winter. With the spring of 1918 the rate climbed again and this time to high points not reached at any other time before or since, during the decade covered by the figures. The rate fell considerably during the summer and autumn of 1918 and, despite the almost invariable tendency to

rise in the spring, it continued low during the winter of 1919 and gradually fell during the spring, rising somewhat in the autumn, but dropping sharply in November and December. An examination of the figures will show that the very unusual decrease in mobility in the spring of 1919 was largely due to the fact that in addition to a marked decrease in the separation rate (unusual at this time of year) there was an even more pronounced drop in the accession rate. It is evident, also, that in the autumn of 1919 the accession rate rose rapidly until October, and then dropped rapidly, while the separation rate continued to drop through the summer and autumn.

A more accurate portrayal of the single factor of seasonality in labor mobility is made in Table VII.

TABLE VII

EXTENT OF LABOR MOBILITY IN THE FOUR SEASONS OF THE YEAR

(Based on the monthly data of the four seasons for all years from 1910-1919, combined)

Month	Number of workers	Total labor hours (thousands)	Labor changes		
			Accessions	Separations	Total (Flux)
			Number		
March, April, May	471,738	353,803	180,482	165,445	345,927
June, July, August	464,579	348,432	150,225	146,828	297,053
Sept., Oct., Nov	479,036	359,278	142,886	119,245	262,131
Dec., Jan., Feb	470,076	352,556	142,023	120,781	262,804
Total	471,357	1,414,069	615,616	552,299	1,167,915
	Rate per 10,000 labor hours				
March, April, May			5.10	4.68	9.78
June, July, August			4.31	4.21	8.52
Sept., Oct., Nov			3.98	3.32	7.30
Dec., Jan., Feb			4.03	3.43	7.46
Total			4.35	3.91	8.26

These figures present a composite picture of the seasonal fluctuations based upon the record of a decade. They also throw some light on the psychological effects of the distinctive physical conditions characterizing the four seasons of the year. The mobility figures have been brought together in this table in such a way as to combine the figures for identical quarterly periods for each of the years from 1910 to 1919, inclusive; it is believed that by such a combination of the figures most of the influences upon mobility which are of a purely industrial character are neutralized and the influence of the seasons more accurately reflected.

Both the figures of Table VII and the monthly flux rates given in Table VI show a quite uniform tendency to maximum labor mobility in the spring, a gradual lessening of mobility during the summer and early autumn, which is the period of minimum mobility, and then, with an increase during the late autumn and winter, culminating again in the maximum mobility period of the following spring. The high mobility rates in the spring months indicate that the labor shiftings are indeed much more numerous at that season of the year. The number of accessions and separations in the months of March, April and May are not only greatest in relation to the number of workers employed, but are absolutely greater in this three-month period than in any other period shown. Here doubtless may be seen the psychological effect which spring appears to have upon the workmen, that is, a certain restlessness and desire for change—in jobs, places of abode *etc.*,—made easier because of the opening up of industrial outdoor work and increased activity in agriculture, lumbering *etc.* At this period, too, the conditions of living are more easily met. The relatively high mobility rates still prevailing during the summer months no doubt indicate the influence of the hot weather upon the industrial stability of the employee.

In the autumn of the year, when colder weather sets in and living conditions are harder to meet, there is a noticeable drop in the labor change rate as a whole. It is especially interesting to note that the proportion of accessions as compared with separations is relatively greater during the months of September, October and November, indicating a tendency for workers to flock back to steadier employment after a period of restlessness and moving about. There is also noticeable a very slight increase in the mobility rates of the winter months over the autumn period, which is perhaps indicative, on the one hand, of a more intensive application of the country's productive forces, and on the other, of changes which are often made by individuals at the end of the old and the beginning of the new year.

Length of Service and Labor Mobility

In the preceding discussion of labor mobility one very important factor, that of length of service, has not been touched upon. Monthly and yearly figures, expressed in the form of accession, separation and flux rates, are valuable for the purpose of showing the general extent of mobility in the labor force as a whole and its trend during any given period of time. Such figures, however, do not throw much light on the degree of stability within the working force in so far as it relates to the length of service of the active as well as the separated employees. Without such figures no correct idea can be formed of the relative extent of labor mobility. It is evident that in the working force as a whole, or in its sex, occupation or other subdivisions, the turnover is not equally distributed. This is due to the varying frequency with which the jobs in each such group may be abandoned by the job holders. It is obvious that the length of time for which jobs are held by individual employees who leave those jobs is a highly important factor in determining the incidence of labor mobility within the establishment work force. This for the reason that the shorter the service of separated employees, the more frequent the job replacements which they occasion and the higher the resulting establishment labor-mobility figures.

The proportion of employees leaving within one year of the time when they were hired is shown in Table VIII.

It appears from these figures that, of the 93,206 employees hired during the year by the 53 plants reporting, 64,758, or 69 per cent, left within twelve months after they were hired. There is evident a good deal of variation between the different

TABLE VIII

NUMBER OF EMPLOYEES LEAVING SERVICE WITHIN 12 MONTHS OF WHEN THEY WERE HIRED, BY INDUSTRY GROUPS, YEAR ENDING MAY 31, 1918

Industry Group	Number of establishments	Total number of persons hired during the year	Of these there left within a year after being hired—	
			Number	Per cent
Automobiles and parts, mfg.	5	12,659	8,230	65
Chemical industries and refineries	3	10,743	8,230	77
Clothing and textile manufacturing	3	6,771	4,799	71
Furniture and millwork	1	3,410	2,681	79
Machinery manufacturing	13	20,881	14,121	68
Mercantile establishments (wholesale and retail)	3	1,931	1,306	68
Miscellaneous metal products manufacturing	13	15,803	13,053	83
Printing and publishing	2	749	518	69
Public utilities: Gas and electricity	1	1,585	721	45
Street railways	1	3,058	1,150	38
Telephone service	8	15,616	9,949	64
Total	53	93,206	64,758	69

industry groups. The least stable group appears to be the metal products manufacturing employees. Eighty-three per cent of those hired in this group left within a year. The most stable group appears to be street railway employees, only 38 per cent of whom left within a year of the date they were hired.

The experience of 34 establishments in 1913–14 and of 53 in 1917–18, which furnished comprehensive figures on the length of service of their active employees, as well as of those who left their employ, is summarized in Table IX.

It will be noticed in this Table, if we consider these employees having to their credit not more than one year of service as short-service employees, that the proportion of such employees in the active work force is rather extensive. On the other hand, it will be observed that considerable proportions among the active employees have long-service records. The figures for those separated, however, present a striking contrast and

TABLE IX

LENGTH-OF-SERVICE DISTRIBUTION OF "ACTIVE EMPLOYEES" (THOSE ON PAY-ROLL AT END OF YEAR) AND OF EMPLOYEES WHO LEFT DURING THE YEAR ("SEPARATING EMPLOYEES")

[Number of establishments reporting, 1913–14, 34; 1917–18, 53]

Length-of-service group	Number in each group			
	On pay roll at end of year		Separated from service during year	
	1913–14	1917–18	1913–14	1917–18
1 week or less	....	1,615	....	16,476
Over 1 week to 2 weeks	....	1,793	....	9,664
Over 2 weeks to 1 month	....	2,948	....	11,541
Over 1 month to 3 months	....	7,055	....	18,912
Three months or less	*11,365*	*13,411*	*28,407*	*56,593*
Over 3 months to 6 months	6,396	6,019	8,516	11,770
Over 6 months to 1 year	7,188	9,018	7,497	9,813
Over 1 year to 2 years	10,446	10,458	4,415	6,645
Over 2 years to 3 years	9,632	6,627	2,162	2,476
Over 3 years to 5 years	12,980	6,320	1,845	2,780
Over 5 years	28,443	19,916	1,776	3,015
Total	86,450	71,769	54,618	93,092
	Per cent in each group			
1 week or less	....	2.3	....	17.7
Over 1 week to 2 weeks	....	2.5	....	10.4
Over 2 weeks to 1 month	....	4.1	....	12.4
Over 1 month to 3 months	....	3.8	....	20.3
Three months or less	*13.1*	*12.7*	*52.0*	*60.8*
Over 3 months to 6 months	7.4	8.4	15.6	12.6
Over 6 months to 1 year	8.3	12.6	13.7	10.5
Over 1 year to 2 years	12.1	14.6	8.1	7.1
Over 2 years to 3 years	11.1	9.2	4.0	2.7
Over 3 years to 5 years	15.0	8.8	3.4	3.0
Over 5 years	32.9	27.8	3.3	3.2
Total	100.0	100.0	100.0	100.0

undoubtedly reflect the influences of unusual industrial activity in both of the periods studied, but more especially the effect of war-time conditions upon labor mobility. In the period 1917–

18, out of a total of 93,092 separated employees, over 40 per cent had, on severing their connections, served periods of less than one month, 33 per cent had worked from one to six months, 10.5 per cent over six months to one year; a total of 84 per cent had to their credit continuous service records of less than one year. In both periods there had also been a considerable exodus of long-service employees—18.8 per cent of all separating employees in 1913–14 and 16 per cent in 1917–18 were employees with service records of over one year. Nevertheless, the census of the active employees taken at the end of the period shows large proportions of employees of long tenure. The figures for 1913–14 show 32.2 per cent with continuous service records of from one to five years, and 32.9 per cent with service records of over five years; and the figures for 1917–18 show 32.6 per cent of all active employees with service records of over one to five years and 27.8 per cent with continuous service records of over five years.[1]

Stable and Unstable Employees[2]

In the discussion of the figures on the length of service of the active working force attention has been called to the fact that in each establishment at a given time there will be found long-service employees who cannot be said to have been a factor in the mobility in a period over which they have served continuously. This brings out the fact that there is more or less concentration in the mobility of the plant forces, and for that reason the rates of mobility as applied to the working force as a whole do not correctly assign the direct responsibility for the labor flux. It is evident that the rates of mobility will be the same if the whole working force changes completely once in the course of a year, or, if one-half of the working force changes 2 times, or, one-fourth of the working force changes 4 times in the course of a year, and so on. In the presentation of the figures that follow an attempt is made to show by means of length-of-service figures exactly what proportion of the work force is responsible for the labor mobility. The detailed figures on length of service given in Table IX show that of 71,769 persons on the pay-rolls in 53 establishments on June 1, 1918, 43,321 or 60 per cent had been in continuous service over one year. These long-service employees were in no way responsible for the labor mobility of these establishments for the 12-month period ended with that date. If we know the number of employees with a service record at least as long as the period for which the labor mobility is reported, the responsibility of that part of the working force which has actually occasioned the labor shifting can be definitely established. In Table X the base upon which the rate of mobility is measured is that part of the working force which directly contributed to it.

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[1] A count of the actual length of service of 439 separated employees in two establishments in the one-week-or-less group showed the number of employees having had specified days of service to be as follows: Less than one day of service, 21 employees; one day, 94 employees; 2 days, 57 employees; 3 days, 54 employees; 4 days, 48 employees; 5 days, 54 employees; 6 days, 111 employees. This shows that over 25 per cent worked one day or less, about 50 per cent worked from two to five days, and only a little over 25 per cent worked a full week. A separate study of the relative proportions of active and separated employees in the different cities and industry groups reveals considerable variation from the figures given in Table IX. Some of these groups show that as high a proportion as 30 per cent of all separated employees of the period 1917–18 had worked one week or less, while in other groups the proportion of the separated employees who had served three months or less was in some industry groups as high as from 60 to 80 per cent.

[2] For figures giving the proportions of stable and unstable employees in 11 Chicago plants see Frankel, Emil, "Labor Turnover in Chicago", *Monthly Labor Review*, September, 1919, pp 44–59. See also on the same subject "Labor Turnover in Cincinnati", *Monthly Labor Review*, March, 1919, pp. 35–52.

This Table shows that in these 53 establishments with a working force of 69,553 there were at the end of the year 43,321 employees representing 62 per cent of the total number on the pay-roll with a service record of over one year. These employees were not responsible for any of the labor changes that took place during the year. The labor mobility was, therefore, concentrated upon 26,232 workers or 38 per cent of the total working force. This relatively small part of the working force was responsible for all the labor changes which took place during the year, involving 93,206 accessions and 96,207 separations, a labor flux of 189,413 persons. This means that for every worker of the unstable working force more than 3 persons were hired and nearly 4 persons left employ-

TABLE X

Comparison of Labor-Mobility Rates Based on the Total Working Force with the Rates Based on the Unstable Part of the Working Force, Year Ending May 31, 1918

Number of establishments	Total working force[1]	Unstable part of working force	Per cent that unstable part of working force is of total working force	Labor hours worked by: Total working force	Labor hours worked by: Unstable part of working force	Labor changes: Accessions	Labor changes: Separations	Labor changes: Total (flux)
53......	69,553	26,232	38	208,659,000	78,696,000	93,206	96,207	189,413

Number of establishments	Rate per 10,000 labor hours, based on total working force: Accessions[2]	Separations[2]	Flux[2]	Rate per 10,000 labor hours, based on unstable working force: Accessions[3]	Separations[3]	Flux[3]
53......	4.5	4.6	9.1	11.8	12.2	24.0

ment, or that altogether there were more than 7 labor changes for each worker. A comparison of the labor mobility of the stable and unstable working force shows the labor-mobility rates based on the labor hours of the unstable part of the work force to be nearly three times as great as the labor-change rates as applied to the labor hours of the whole working force.

Employment Management and Labor Stability[4]

A very effective illustration of the practical usefulness of mobility-rate figures is furnished in a comparison of the mobility experience of 10 selected establishments with that of all other establishments reporting. These ten concerns were chosen not only because they had definite labor policies and centralized employment machinery but also on account of the fact that they had had considerable success in stabilizing their work forces and keeping their labor flux rates at relatively low levels.

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[1] This number is 2,216 less than the number on the pay-roll of the 53 establishments at the end of May, 1918, as shown in Table IX, the labor time of the employees with less than one year's continuous service having been reduced to equivalent full year or 3,000-hour workers.

[2] Represents ratio of labor changes (accessions, separations and flux) to labor hours of total working force.

[3] Represents ratio of labor changes (accessions, separations and flux) to labor hours of unstable part of working force.

[4] For a valuable discussion of different employment methods and their effect upon

The definite effectiveness of liberal labor policies and centralized systems of employment is demonstrated, in so far as it is possible to demonstrate such things in statistical terms, by the figures presented in Table XI. This Table shows, by years, for the period from 1913 to 1919, inclusive, the mobility rates of the 10 selected firms and of all other firms reporting.

This Table shows in very striking fashion that the ten selected concerns have brought about a considerable reduction in the extent of their labor flux and have suffered a much slighter decrease in stability during the war period than did the general run of establishments. For the whole period, 1913–1919, the 10 selected concerns had an average labor flux rate of 5.1 as compared with a rate of 7.5 for all other concerns. The selected plants reduced their flux rates from 10.9 in 1913 to 5.6 in 1919 but were forced up to 6.1 in 1918, which was the highest point reached after 1913. Establishments generally began with a rate of 8.7 in 1913, were pushed in 1918 up to 13.6 (over twice the mobility experienced by the selected concerns) and finished in 1919 with a rate of 7.0. This comparison of achievements, which covers a relatively long period, shows the vital importance from the standpoint of the industrial establishment of studying this subject of labor mobility, the necessity of examining the employment and personnel methods

labor stability, see Sumner H. Slichter, The Turnover of Factory Labor (New York, 1919). See also Kelly, R. W., Hiring the Worker (New York, 1918) and Colvin, F. H., Labor Turnover, Loyalty and Output (New York, 1919). The following articles describe in detail the methods used in certain establishments which have successfully applied modern employment practices: "Labor Turnover and Employment Policies of a Large Motor-vehicle Manufacturing Establishment", by Boris Emmet, *Monthly Labor Review*, October, 1918; "Employment Policy and Labor Stability in a Pacific Coast Department Store" and "Employment Policies and Labor Mobility in a California Sugar Refinery", by P. F. Brissenden, *Monthly Labor Review*, November and December, 1919.

TABLE XI

Comparison of Labor Mobility in 10 Selected Establishments with its Mobility in all other Establishments Reporting for the Calendar Years 1913 to 1919, Inclusive

Year	Labor change rates per 10,000 labor hours					
	10 selected establishments			All other establishments reporting		
	Accession	Separation	Flux	Accession	Separation	Flux
1913......	5.4	5.5	10.9	4.4	4.3	8.7
1914......	1.1	1.5	2.6	2.8	3.1	5.9
1915......	1.6	0.8	2.4	3.0	2.6	5.6
1916......	2.6	1.4	4.0	6.2	4.5	10.7
1917......	1.7	1.9	3.6	5.8	5.7	11.5
1918......	3.4	2.7	6.1	7.4	6.2	13.6
1919......	3.2	2.4	5.6	3.6	3.4	7.0
	2.8	2.3	5.1	3.8	3.7	7.5

currently practiced by the more far-sighted employers, and the desirability of keeping systematic employment records in order to gauge the effect of labor policy upon labor stability. Finally, it demonstrates the urgent need for the more widespread adoption by employers generally of such labor and employment policies as will be most effective in eliminating from industrial life the evil and the waste of excessive labor mobility.

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